

August 25, 2011 1:54 am

From figure skaters to the factory floor

By Paul Taylor

Dave Westphal's 13-year-old daughter, Rachel, is a competitive figure skater. She is also the inspiration for a manufacturing improvement initiative at Nexteer Automotive, a leading US-based maker of steering and driveline systems for the car industry, where her father is director of lean manufacturing.

Nexteer, which has a global workforce of 9,800 and counts **General Motors, Ford, Chrysler, Toyota** and **Fiat** among its customers, is one of the first heavy manufacturing companies to use an innovative video motion analysis and training software system developed by a small Swiss-based company called Dartfish.

"We are the world leader in 2D video analysis for biomechanics, being used today by many of the leading biomechanics experts and university programs," says Victor Bergonzoli, Dartfish chief executive.

Dartfish's motion analysis software is used extensively by athletes in competitive sports during training routines to analyse their performances, correct mistakes and to increase their chances of taking home coveted medals at events like the 2010 Vancouver Olympics where Dartfish users won 162 medals.

Three years ago, while watching his daughter practice at a skating rink near the Nexteer plant in Saginaw, Michigan, Mr Westphal had an idea. Perhaps, he thought, the same video motion analysis system that the skating coaches were using to instantly analyse jumps and improve the performances of their young charges could also be used on the factory floor to achieve greater insight into Nexteer's manufacturing operations.

"People learn by seeing," Mr Westphal explains. Indeed, according to the American Optometric Association, 80 per cent of learning is visual-based. What Dartfish enables people to do is to let them see themselves as they are doing something or, in Nexteer's case, making something. "What Dartfish does best is making the invisible visible."

"One of the things I noticed as I watched kids learn how to do these very physical, very complex ice skating jumps was that maybe kids could not feel what they were doing wrong literally in the air – blind, I'll call it – were able to skate up to a PC sitting on the boards at the ice rink and a coach using Dartfish could very quickly diagnose that their hand was in the wrong position or that the body line was wrong.

"The skaters make the mental connections right away and are able to make the corrections."

He adds: “My challenge here at Nexteer is to make us a better organisation through continuous improvement and so I am always looking for ways to improve quality and productivity. All these very difficult measures because we’ve been doing this for a long time, over 100 years.”

After discussing his idea with Vince DeZorzi, Nexteer’s vice-president of operations, the company decided to test the Dartfish technology and began to collaborate with Dartfish on using the software to analyse performance and ensure plant process consistency. “The idea is that if a process is not performing the way we want, we can discover where the pitfall is and how to correct it fast,” says Mr Westphal.

Using the Dartfish software, Nexteer recorded three different workers at the same operation, and then overlaid their images to show differences in how they performed standard work such as parts set-up and quality checks. After the analysis, they achieved a 21 per cent improvement.

“We confirmed that the three components the software relies on for success – time, motion and quality – are relevant to the plant floor,” said Mr Westphal. “It takes a leap of faith to try something new, and in our case it has been exceptionally successful. As far as we know, we are the only organisation in the world using Dartfish for manufacturing improvement.”

Beginning in 2008, Dartfish was incorporated into Nexteer’s continuous improvement programme. “We have learnt and applied it to over 400 different types of processes,” says Mr Westphal. He estimates that it has saved Nexteer several hundred thousand dollars in process and machine improvements in the manufacturing of its electric power steering, hydraulic power steering, steering columns and half shafts.

“It has allowed us to get an insight into everything from human kinematics, to machining mechanics, to lean processing – literally any place where you have motion,” says Mr Westphal.

“In a lot of cases, when we go in and do a workshop and use Dartfish, we’ll see 20 and 30 per cent gains in operational availability. That is huge. Typical operational availability gains for a traditional problem solving might be in the 5 to 7 per cent range.”

So does Mr Westphal think Dartfish technology is applicable to a large range of manufacturing industry? “Absolutely,” he says. “I have worked with companies in sectors ranging from healthcare to bottling and from food processors to steel producers. In all of those organisations, the same types of waste occur. Dartfish can make that waste visible.”

Mr Westphal says the team at Nexteer has made one other interesting discovery. “We have noticed that the younger portion of our workforce is far more tech-savvy – every kid has an iPhone or an iPad or a BlackBerry or some other type of multimedia device in their pocket. They really embrace this technology.”

“They have likely seen the video analysts technology used in some sporting event or some

race scenario. When they get to see themselves on it, it is actually a motivator to say, wow, I never knew that was happening or, man, I'd love to help make that better ... The ability for these young people to see what they are doing and how to do it more efficiently just hits with a ring every time."

For Nexteer to be competitive in an industry with relatively low margins, Mr Westphal says the company "has to lead the pack in quality, productivity, cost per unit".

"Those are the things that differentiate us from everyone else and so we use every technological edge that we possibly can," he says. "This is another tool in our toolkit that gives us just an amazing boost in our ability to run faster than the rest of the pack."

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